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ASSIGNMENT BOOKLET

SCN3240 Chemistry 30

Module 8 Assignment

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Chemistry 30

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we explore

Acid-Base Equilibrium

Module 8

Assignment Booklet



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FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Lesson 2 Assignment		
Lesson 4 Assignment		
Lesson 6 Assignment		
Lesson 7 Assignment		

Teacher's Comments

Chemistry 30 Learn EveryWare
Module 8: Acid-Base Equilibrium
Assignment Booklet
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Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	



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Read all parts of your assignment carefully, and record your answers in the appropriate places. If you have difficulty with an assignment, review the relevant sections of the lesson and the textbook. Be sure to proofread your answers carefully before submitting your Assignment Booklet.

MODULE 8: LESSON 2 ASSIGNMENT

Lesson 2 Assignment: Acid Strength and Equilibrium

Use the following information to answer the first question.

Acid	pH of 0.10 mol/L solution
$\text{HNO}_3(\text{aq})$	1.0
$\text{HNO}_2(\text{aq})$	2.2

1. Nitric acid and nitrous acid are two acids associated with acid deposition.
 - a. Use the information in the table to identify which acid is a strong acid and which is a weak acid. Support your reasoning without the use of a calculation.
 - b. Support your answer to question 1.a. using a calculation.

- c. Identify one other difference that you would expect if you tested these two solutions. Include the name of the test, the expected results for each solution, and the reasoning for the expected difference.
2. Complete "Section 16.1" question 10 on page 721 of the textbook.
3. Complete "Section 16.1" question 13 on page 721 of the textbook.

MODULE 8: LESSON 4 ASSIGNMENT**Lab—Testing Brønsted-Lowry Reaction Predictions****Pre-Lab**

1. The investigation you will complete involves combining the solutions listed in the tables below. Use the method to predict acid-base reactions to complete the following tasks for each reaction provided:
 - Write a balanced chemical equation.
 - Indicate the position of equilibrium for the resulting system.
 - Predict the result of each reaction.
 - Identify the result of one test you would perform to confirm the prediction.

List your answers in the tables provided.

REACTION 1

Reactants		Predictions	
Aqueous Ammonium Chloride	Aqueous Sodium Hydroxide	Balanced Chemical Equation	
		Position of Equilibrium	
		Predicted Result	
		Test to Confirm	

REACTION 2

Reactants		Predictions	
Aqueous Sodium Ethanoate	Hydrochloric Acid	Balanced Chemical Equation	
		Position of Equilibrium	
		Predicted Result	
		Test to Confirm	

REACTION 3

Reactants		Predictions	
Aqueous Sodium Hydrogen Carbonate	Aqueous Sodium Hydrogen Sulfate	Balanced Chemical Equation	
		Position of Equilibrium	
		Predicted Result	
		Test to Confirm	

REACTION 4

Reactants		Predictions	
Aqueous Sodium Benzoate	Aqueous Sodium Hydrogen Sulfate	Balanced Chemical Equation	
		Position of Equilibrium	
		Predicted Result	
		Test to Confirm	

Observations

2.

Reaction	Reactant 1	Reactant 2	After Combination
1			
2			
3			
4			

Analysis

3. For each reaction performed (Reactions 1–4), indicate whether the observations you made confirm the predictions you made in the Pre-Lab section of this investigation.

MODULE 8: LESSON 6 ASSIGNMENT

Lesson 6 Assignment: Ph Curves

- Earlier you learned that carbonate, $\text{CO}_3^{2-}(\text{aq})$, is a component of soil and can neutralize acid deposition. Given what you have learned about acid-base reactions and pH curves, sketch the pH curve for soil containing carbonate ions that undergo continual addition of hydronium ions from acid deposition. Include relevant chemical equations and information that explain the aspects of the pH curve you sketch.
- Complete the ICE table for a solution of nitrous acid, $\text{HNO}_2(\text{aq})$, one of the acids associated with acid deposition.

Concentration	$\text{HNO}_2(\text{aq})$	$\rightleftharpoons$	$\text{H}_3\text{O}^+(\text{aq})$	$\text{NO}_2^-(\text{aq})$
Initial (mol/L)	0.045			
Change (mol/L)				
Equilibrium (mol/L)			0.0043	

- b.** Calculate the pH of the nitrous acid solution.

3. The K_b for ammonia is 1.8×10^{-5} .
- Use a chemical reaction to explain how aqueous ammonia can create a basic solution.
 - Calculate the hydroxide ion concentration and the pH of a 0.125 mol/L ammonia solution.
4. The equilibrium concentration for a weak monoprotic acid is 0.075 mol/L. The measured pH is 6.25. Calculate the K_a for this acid.

5. The pH of a 0.002 50 mol/L solution of benzoic acid is 3.65. Calculate the K_a for benzoic acid.

MODULE 8: LESSON 7 ASSIGNMENT

Lesson 7 Assignment: Buffers

1. Buffers that match the pH of blood and the cytoplasm are commonly required in scientific experiments. If you were studying the effects of lactic acid on muscles and needed to design a buffer that would have a pH of 7.2, what chemical components would you select and in what proportions? Include relevant calculations in your answer.

